Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, ID 83401

April 26, 2005

Nicholas Ceto, INEEL Project Manager
EPA Region 10
309 Bradley Landing, Suite 115
Richland, WA 99352

Daryl F. Koch, Remediation Manager
Waste and Remediation Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

SUBJECT: Transmittal of Request to Change the Existing PM-2A V-14 Staging Area to Temporary Unit and Proposed New Constituents for ICDF Landfill and Evaporation Pond Waste Acceptance Criteria (FMDP-RFDP-05-024)

Dear Mr. Ceto and Mr. Koch:

This letter transmits a request for a change in designation for the existing PM-2A V-14 tank storage area and also the proposed new constituents for addition to the ICDF Complex Waste Acceptance Criteria.

The first attachment is a request for a change in designation of the existing PM-2A V-14 tank storage area near the INL CERCLA Disposal Facility (ICDF) evaporation ponds from a staging area to a temporary unit. The attached drawing identifies the area for change just north of the evaporation ponds. This is needed to allow treatment of the contents of this tank prior to final disposal into the ICDF landfill. Upon your review and concurrence the Staging Area designation will be changed.

The second attachment includes the proposed new constituents for addition to the ICDF Complex Waste Acceptance Criteria (WAC). The new constituents were identified in the semiannual data call submitted by all the Waste Area Groups (WAGs). Upon your review and approval the new constituents will be updated into the respective WACs.

If you have questions regarding either attachments, please contact me at 208-526-7001 or verwolmc@id.doe.gov.

Sincerely,

Mary C. Verwolf

Mary C. Verwolf
ICDF Project Manager
Environmental Restoration Program

Enclosures

cc: M. Spomer, Idaho Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706
D. Einan, EPA Region X, 309 Bradley Landing, Suite 115, Richland, WA 99352

UFC: 6102.RFDP.313
FMDP-RFDP-05-024

EXTERNAL bcc DISTRIBUTION:
ARDC, BBWI, MS3922, w/o enc.
Jack Simonds, MS 3950, w/o enc.
M. Heileson, MS 3950, w/o enc.

ID DISTRIBUTION:
Administrative Support Center (Scanning)
! Administrative Support Center in Outlook (Elec.Copy)
M. Verwolf, MS 4149, w/ enc.
K. Hain, MS 1222, w/o enc.
A. Kraupp, MS 1226, w/o enc.

CONCURRENCE:
EM_____

RECORD NOTES:

1. This letter transmitted the Request to Change the Existing PM-2A V-14 Staging Area to Treatment Unit and Proposed New Constituents for ICDF Complex to EPA and IDEQ.

2. This letter was written by Mary C Verwolf

3. This letter/memo closes OATS number N/A

4. The attached correspondence has no relation to the Naval Nuclear Propulsion Program.

[Author] [Acronym for the AM/DIR] Mary C Verwolf, 6-7001, April 26, 2005, O:\NE-ID\EM-ICP\FMDP\RFDP\RFDP letters 2005\FMDP-RFDP-05-024.doc

40 CFR 264.553 (C) In establishing standards to be applied to a temporary unit, the Regional Administrator shall consider the following factors:

(1) Length of time such unit will be in operation; *January to September 30, 2005*

(2) Type of unit; *CERCLA storage and treatment*

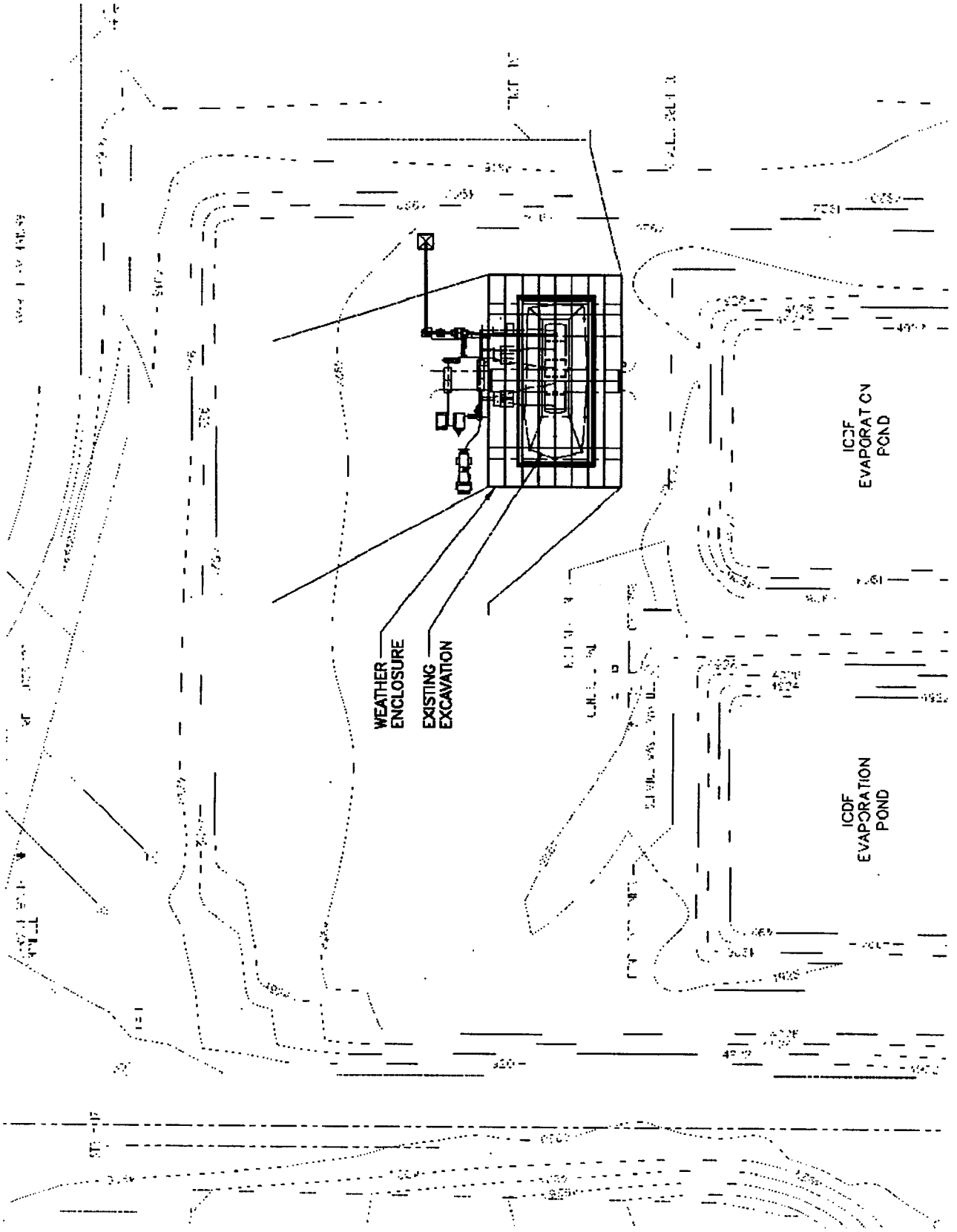
(3) Volumes of waste to be managed; *V-14 contents (approximately 46,000 lbs.)*

(4) Physical and Chemical Characteristics of the wastes to be managed in the unit: 20 to 25 *weight percent diatomaceous earth, 20 to 25 percent dark wet sludge, and 50-60 percent water. F001 Tetrachloroethylene that will be reduced through treatment from approximately 100-100 mg/kg to less than 6 mg/kg.*

(5) Potential for releases from the unit: *Residue will be treated in the tank via air sparging and the off gas will be filtered through granular activated carbon to remove volatilized organic constituents (primarily tetrachloroethylene). Then the treated contents will be solidified. The tank is adequate containment but is also contained within an impermeable secondary containment system to prevent the release of waste materials.*

(6) Hydro geologic and other relevant environmental conditions at the facility which may influence the migration of any potential releases; *None, the tank is placed in a lined depression on a man made soil berm next to the ICDF Evaporation ponds.*

(7) Potential for exposure of humans and environmental receptors if releases were to occur from the unit. *The enclosure for the tank is located within the AOC for OU 3-13 on the INL. Public access is limited and only trained workers are allowed access within the area during the treatment process. . Potential for exposure during the treatment process is controlled by the filtration and treatment process design to limit the increase in exposure potential to be within the approved risk basis for the existing CERCLA facility.*


WEATHER ENCLOSURE
EXISTING EXCAVATION
ICDF EVAPORATION POND
ICDF EVAPORATION POND

ICDF-WAC Recommendations – April 2005

Prepared for: ICDF Implementation Project

Prepared by: BBWI, James M. McCarthy and Paul Ritter

Date: April 13, 2005

The purpose of this report is to present waste acceptance criteria (WAC) for several constituents that may be placed in the Idaho CERCLA Disposal Facility (ICDF) landfill and evaporation ponds. The constituents to be considered are listed in Table A. The generators reported the soil concentration shown in Table A. Although the soil concentrations are listed as the design inventory in other tables of this report, the concentrations are generally the same as the RCRA treatment standards found in the table of universal treatment standards (40CFR 268.48).

Table A. List of constituents requested for WAC calculation.

Constituent	CAS #	Soil Concentration Reported by the Generators (mg/kg)
Carbon Tetrachloride	56-23-5	6
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	30
Chloroform	67-66-3	6
PCBs	1336-36-3	10
Trichlorofluoromethane	75-69-4	30
Pyridine	110-86-1	16
Bromoform	75-25-2	15
Trans-Acetylene Dichloride (1,2-Dichloroethene)[a]	156-60-5	30
Ether (ethyl ether)	60-29-7	160
m-Cresol (mixed isomers)[b]	108-39-4	5.6
Creosote oil	8001-58-9	6
Methanol (methyl alcohol)	67-56-1	1

a. There is a current WAC for 1,2-dichloroethene of 0.32 mg/kg. The current WAC was set to 1,000 the design inventory identified when the WAC was developed. Since this is not a performance based WAC value, the WAC is being updated.
b. Only m-cresol is not listed in WAC

A. BACKGROUND

The INEEL is disposing of remediation wastes at the ICDF and planned disposals have identified constituents that were not included in the original WAC and constituents for which the waste has soil concentrations greater than the original WAC. Since for many constituents, the WAC was simply set to 1000 times the original design soil concentration, a reevaluation is needed to calculate a WAC based on the predicted leachate and future peak groundwater concentrations.

B. METHODOLOGY

The WAC formulation processes are described in DOE/ID-10865, "Waste Acceptance Criteria for the ICDF Landfill and DOE/ID-10866, "Waste Acceptance Criteria for ICDF Evaporation Pond" were followed to establish WAC limits.

C. RESULTS AND DISCUSSION

Based on the documentation in DOE/10865 and DOE/ID-10866 tables were identified that need to be updated with the new constituents or new soil concentration estimates. The results are presented in the next two sections.

D. DOE/ID-10865, "WASTE ACCEPTANCE CRITERIA FOR ICDF LANDFILL"

DOE/ID-10865, "Waste Acceptance Criteria for ICDF Landfill" including the main document and appendices should be amended with the following tables.

Table 3-3. in REV 7 and Table 5-2. ICDF Landfill Waste Acceptance Criteria

Constituent	Selected WAC Concentration Guideline (mg/kg)	Landfill WAC Maximum Mass[a] (kg)	Source of WAC Concentration Guideline
Carbon Tetrachloride	500	3.79E+05	Regulatory Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	100,000	7.59E+07	Regulatory Limit
Chloroform	285	2.16E+05	Liner Compatibility
PCBs	500	3.79E+05	Regulatory Limit
Trichlorofluoromethane	500	3.79E+05	Regulatory Limit
Pyridine	500	3.79E+05	Regulatory Limit
Bromoform	500	3.79E+05	Regulatory Limit
Trans-Acetylene Dichloride (1,2-Dichloroethene)[b]	500	3.79E+05	Regulatory Limit
Ether (ethyl ether)	358	2.72E+05	Liner Compatibility
m-Cresol (mixed isomers)	100,000	7.59E+07	Regulatory Limit
Creosote oil	31,587	2.40E+07	Liner Compatibility
Methanol (methyl alcohol)	500	3.79E+05	Regulatory Limit

a. From soil conc.(mg/kg) WAC (Table D-1) * bulk density (1946 Kg/m^3) * total ICDF soil volume (389,923 m^3)/1E6 mg/Kg)
b. There is a current WAC for 1,2-dichloroethene of 0.32 mg/kg. The current WAC was set to 1,000 the design inventory identified when the WAC was developed. Since this is not a performance based WAC value, the WAC is being updated.

Table A-2. Selected Allowable Waste Soil Concentrations Based on RAOs.

Constituent	Type[a]	Design Inventory Concentration [b] (pCi/kg or mg/kg)	Adjusted Maximum Inventory to Not Exceed Groundwater RAOs in 1E+06 yrs [a] (mg/kg)	Basis for Adjusted Maximum Inventory
Carbon Tetrachloride	Volatile Organic	6	No Limit	Decays before reaching aquifer
1,1,2-Trichloro-1,2,2-trifluoroethane	Organic	30	No Limit	Decays before reaching aquifer
Chloroform	Volatile Organic	6	No Limit	Decays before reaching aquifer
PCBs	PCB	10	No Limit	Decays before reaching aquifer
Trichlorofluoromethane	Volatile Organic	30	No Limit	Decays before reaching aquifer
Pyridine	Volatile Organic	16	No Limit	Decays before reaching aquifer
Bromoform	Volatile Organic	15	No Limit	Decays before reaching aquifer
Trans-Acetylene Dichloride (1,2-Dichloroethene)	Volatile Organic	30	No Limit	Decays before reaching aquifer
Ether (ethyl ether)	Volatile Organic	160	No Limit	Decays before reaching aquifer
m-Cresol (mixed isomers)	Organic	5.6	No Limit	Decays before reaching aquifer
Creosote oil	Organic	10,000	No Limit	Decays before reaching aquifer
Methanol (methyl alcohol)	Volatile Organic	1	No Limit	Decays before reaching aquifer

a. For purposes of this analysis, the definition of VOC is taken from 40 CFR 265.1081 (definition) and the table in 40 CFR 265 Appendix VI is used to define whether or not a constituent is a VOC. If a constituent is not on the list, it is defined as a VOC.

b. The constituents are all predicted to decay completely in the ICDF landfill and vadose zone, during transport to the aquifer. The following are the biodegradation half-lives assumed for the calculations. The predicted water travel time to the aquifer is 30,000 years. The contaminant half lives are as follows

Carbon Tetrachloride	1 yr	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	2 yr	
Chloroform	5 yr	
PCBs	0.5 yr	
Trichlorofluoromethane	2 yr	
Pyridine	0.04 yr	
Bromoform	1 yr	
Trans-Acetylene Dichloride (1,2-Dichloroethene)	1.1 yr	
Ether (ethyl ether)	100 yr	No data conservative estimate
m-Cresol (mixed isomers)	0.13 yr	
Creosote oil	100 yr	No data conservative estimate
Methanol (methyl alcohol)	0.019 yr	

Table B-1. Maximum Allowable Concentration in Soil for Liner Compatibility

Constituents	Average Leachate Concentration[a], C_{Liquid} (mg/L)	Design Inventory Concentration in Soil, C_{Soil} (mg/kg)	Waste Soil to Leachate Ratio, C_{Soil}/C_{Liquid} (L/kg)	Max Concentration Allowed in Leachate for Compatibility (mg/L)	Maximum Allowable Concentration in Soil For Compatibility [a] (mg/kg)
Carbon Tetrachloride	2.80	6	2.14	2,000	4.29E+03
1,1,2-Trichloro-1,2,2-trifluoroethane	1.53	30	19.7	500,000	9.83E+06 (No Limit)
Chloroform	42	6	0.14	2,000	2.85E+02
PCBs	0.00032	10	31,193	2,000	6.24E+07 (No Limit)
Trichlorofluoromethane	96	30	0.31	2,000	6.27E+02
Pyridine	1.03	16	15.6	100,000	1.56E+06 (No Limit)
Bromoform	24.04	15	0.62	2,000	1.25E+03
Trans-Acetylene Dichloride (1,2-Dichloroethene)	47	30	0.64	2,000	1.27E+03
Ether (ethyl ether)	894	160	0.18	2,000	3.58E+02
m-Cresol (mixed isomers)	1.20	6	4.66	100,000	4.66E+05
Creosote oil	158,295	10,000	0.063	500,000	3.16E+04
Methanol (methyl alcohol)	0.031	1	32.4	500,000	1.62E+07 (No Limit)

a. If the maximum allowable concentration were greater than 1E6 mg/kg or 1kg/kg then the ICDF liner would be compatible with the entire ICDF filled with that constituent. Therefore there is no limit.

Table D-1. WAC Concentration Selection

Constituent	Groundwater RAO Guidance Concentration [a] (mg/kg)	Liner Compatibility [b] (mg/kg)	Regulatory Limitation [c] (mg/kg)	Background [d] (mg/kg)	Selected WAC Concentration (mg/kg)	Source of WAC Concentration
Carbon Tetrachloride	No Limit	4,288	500	NA	500	Regulatory Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	No Limit	No Limit	100,000	NA	100,000	Regulatory Limit
Chloroform	No Limit	285	500	NA	285	Liner Compatibility
PCBs	No Limit	No Limit	500	NA	500	Regulatory Limit
Trichlorofluoromethane	No Limit	627	500	NA	500	Regulatory Limit
Pyridine	No Limit	No Limit	500	NA	500	Regulatory Limit
Bromoform	No Limit	1,248	500	NA	500	Regulatory Limit
Trans-Acetylene Dichloride (1,2-Dichloroethene)	No Limit	1,270	500	NA	500	Regulatory Limit
Ether (ethyl ether)	No Limit	358	500	NA	358	Liner Compatibility
m-Cresol (mixed isomers)	No Limit	465,547	100,000	NA	100,000	Regulatory Limit
Creosote oil	No Limit	31,587	100,000	NA	31,587	Liner Compatibility
Methanol (methyl alcohol)	No Limit	No Limit	500	NA	500	Regulatory Limit

a. From Table A-2 in the ICDF Landfill WAC.
b. From last column of Table B-1, "Maximum Allowable Concentration in Soil for Compatibility"
c. Total organic constituents cannot exceed 10% by weight (100,000 mg/kg) per 40 CFR 264.1050(f), total volatile organic constituents cannot exceed 500 ppm per 40 CFR 264.108(c)(1). And Total PCBs cannot exceed 500 mg/kg (40 CFR 761.60).
d. No organic background expected.

Table F-1. Comparison of Design Inventory and Waste Acceptance Criteria Concentrations.

Constituent	Design Inventory (DI) Mass or Activity [a] (kg)	Waste Acceptance Criteria (WAC) Mass or Activity [b] (kg)	Mass or Activity Comparison (DI/WAC) %
Carbon Tetrachloride	4.55E+03	3.79E+05	1.2%
1,1,2-Trichloro-1,2,2-trifluoroethane	2.28E+04	7.59E+07	0.0%
Chloroform	4.55E+03	2.16E+05	2.1%
PCBs	7.59E+03	3.79E+05	2.0%
Trichlorofluoromethane	2.28E+04	3.79E+05	6.0%
Pyridine	1.21E+04	3.79E+05	3.20%
Bromoform	1.14E+04	3.79E+05	3.0%
Trans-Acetylene Dichloride (1,2-Dichloroethene)	2.28E+04	3.79E+05	6.0%
Ether (ethyl ether)	1.21E+05	2.72E+05	45%
m-Cresol (mixed isomers)	4.25E+03	7.59E+07	0.01%
Creosote oil	7.59E+06	2.40E+07	32%
Methanol (methyl alcohol)	7.59E+02	3.79E+05	0.20%

a. From design inventory soil conc.(mg/kg) (Table A-2) * bulk density (1946 Kg/m^3) * total ICDF soil volume (389,923 m^3 / 1E6 mg/Kg)
b. From soil conc.(mg/kg) WAC (Table D-1) * bulk density (1946 Kg/m^3) * total ICDF soil volume (389,923 m^3 / 1E6 mg/Kg)

E. DOE/ID-10866, "WASTE ACCEPTANCE CRITERIA FOR ICDF EVAPORATION POND"

DOE/ID-10866, "Waste Acceptance Criteria for ICDF Evaporation Pond" including the main document and appendices should be amended with the following tables.

Table 5-2. Chemical Waste Acceptance Criteria for Evaporation Pond.

Constituent	ICDF Evaporation Pond WAC [a]	Source of ICDF Evaporation Pond WAC
	(mg/L)	
Carbon Tetrachloride	500	Regulatory Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	100,000	Regulatory Limit
Chloroform	500	Regulatory Limit
PCBs	50	Regulatory Limit
Trichlorofluoromethane	500	Regulatory Limit
Pyridine	500	Regulatory Limit
Bromoform	500	Regulatory Limit
Trans-Acetylene Dichloride (1,2-Dichloroethene)	500	Regulatory Limit
Ether (ethyl ether)	500	Regulatory Limit
m-Cresol (mixed isomers)	100,000	Regulatory Limit and Liner Compatibility
Creosote oil	100,000	Regulatory Limit
Methanol (methyl alcohol)	500	Regulatory Limit

a. ICDF Evaporation Pond WAC - the WAC comes from Table B-1.

Table A-1. Suggested Maximum Leachate Concentrations for Organic Constituents for Liner Compatibility.

Constituent	Predicted Peak Concentration in Leachate [a]	Compatible Concentration For HDPE [bc]	Compatible Concentration for GCL [bc]	Compatible Concentration for Clay [bc]	Suggested Maximum Leachate Concentration [d]
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Carbon Tetrachloride	29	2,000	-	-	2,000
1,1,2-Trichloro-1,2,2-trifluoroethane	7.98	500,000	-	-	500,000
Chloroform	100	2,000	-	-	2,000
PCBs	0.007	2,000	-	-	2,000
Trichlorofluoromethane	500	2,000	-	-	2,000
Pyridine	267	100,000	-	-	100,000
Bromoform	250	2,000	-	-	2,000
Trans-Acetylene Dichloride (1,2-Dichloroethene)	446	2,000			2,000
Ether (ethyl ether)	941	2,000	-	-	2,000
m-Cresol (mixed isomers)	93.3	100,000	-	-	100,000
Creosote oil	166,667	500,000	-	-	500,000
Methanol (methyl alcohol)	17	500,000	-	-	500,000

a. Predicted peak leachate concentration of the ICDF landfill operation (basic methodology described in EDF-ER-274).
b. "-" indicates that a specific test value was not available, compatibility issues are not anticipated.
c. From manufacturers specifications. (Table 5 in EDF-ER-278 pages 74 – 78 lists compatible concentration for HDPE liners.)
d. The suggested maximum concentration selected for the ICDF liner system is based on the lowest of the concentrations listed for HDPE, GCL, and clay materials and are applicable for the leachate in the landfill and the waste liquids in the evaporation ponds.

Table B-1. Maximum Allowable Evaporation Pond Liquid Concentration.

Constituent	Pond Liner Maximum Concentrations [a]	Regulatory Limitations [b]	ICDF Evaporation Pond WAC [c]	Source of ICDF Evaporation Pond WAC
	(mg/L)	(mg/L)	(mg/L)	
Carbon Tetrachloride	2,000	500	500	Regulatory Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	500,000	100,000	100,000	Regulatory Limit
Chloroform	2,000	500	500	Regulatory Limit
PCBs	2,000	50	50	Regulatory Limit
Trichlorofluoromethane	2,000	500	500	Regulatory Limit
Pyridine	100,000	500	500	Regulatory Limit
Bromoform	2,000	500	500	Regulatory Limit
Trans-Acetylene Dichloride (1,2-Dichloroethene)	2,000	500	500	Regulatory Limit
Ether (ethyl ether)	2,000	500	500	Regulatory Limit
m-Cresol (mixed isomers)	100,000	100,000	100,000	Regulatory Limit and Liner Compatibility
Creosote oil	500,000	100,000	100,000	Regulatory Limit
Methanol (methyl alcohol)	500,000	500	500	Regulatory Limit

a. From Table A-1, Column 6.
b. Regulatory Limitations - comes from 40 CFR 264.1050(b) (organics are limited at 10% by weight, 40 CFR 1082(c)(1) (Total VOC concentration cannot exceed 500 mg/L, and the . Toxic Substances Control Act (PCB concentrations in water cannot exceed 50 mg/L).
c. Minimum between the pond liner and regulatory limitations.
d. Liquid PCB limit of 50 ppm is from the US Code, Title on Public Health and Welfare, chapter on Solid Waste Disposal. The reference is Title 42, Chapter 82, Subchapter III, 6924(d)(2)(D). "Liquid hazardous wastes containing polychlorinated biphenyls at concentrations greater than or equal to 50 ppm."